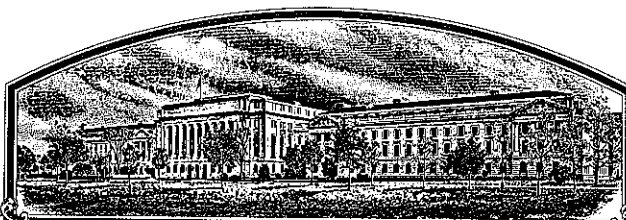


No.

9500094



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Western Plant Breeders, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED, PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE FOREGOING PURPOSES, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT

'Vanna'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this thirty-first day of August in the year of our Lord one thousand nine hundred and ninety-five.

Attest:

Acting Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture



U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE DIVISION

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(INSTRUCTIONS ON REVERSE)

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) (as it is to appear on the Certificate) Western Plant Breeders, Inc		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NO. BZ 684-23	3. VARIETY NAME Vanna
4. ADDRESS (street and no. or R.F.D. no., city, state, and ZIP) 8111 Timberline Drive Bozeman, Montana 59715		5. PHONE (include area code) (406) 587-1218	FOR OFFICIAL USE ONLY PVPO NUMBER 9500094
6. GENUS AND SPECIES NAME Triticum aestivum	7. FAMILY NAME (Botanical) Graminea		F I L I N G Date FEBRUARY 28, 1995 Time <input type="checkbox"/> A.M. <input type="checkbox"/> P.M.
8. CROP KIND NAME (Common Name) Common Wheat (soft white spring)		9. DATE OF DETERMINATION Aug. 1, 1989	F E E S Filing and Examination Fee: \$ 2,325.00 Date Feb. 28, 1995
10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.) Corporation		Certificate Fee: \$ 300.00 Date July 3, 1995	
11. IF INCORPORATED, GIVE STATE OF INCORPORATION Arizona		12. DATE OF INCORPORATION August 24, 1990	
13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS Dr. Dale R. Clark Western Plant Breeders, Inc. 8111 Timberline Drive Bozeman, MT 59715 PHONE (include area code): (406) 587-1218			

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow INSTRUCTIONS on reverse)		February 27, 1995	
a. <input type="checkbox"/> Exhibit A, Origin and Breeding History of the Variety			
b. <input checked="" type="checkbox"/> Exhibit B, Novelty Statement			
c. <input checked="" type="checkbox"/> Exhibit C, Objective Description of Variety			
d. <input checked="" type="checkbox"/> Exhibit D, Additional Description of Variety			
e. <input checked="" type="checkbox"/> Exhibit E, Statement of the Basis of Applicant's Ownership			
f. <input checked="" type="checkbox"/> Seed Sample (2,500 viable untreated seeds). Date Seed Sample mailed to Plant Variety Protection Office	February 27, 1995		
g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$2,325) made payable to "Treasurer of the United States"			
15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See section 83(a) of the Plant Variety Protection Act) <input type="checkbox"/> YES (If "YES," answer items 16 and 17 below) <input checked="" type="checkbox"/> NO (If "NO," skip to item 18 below)			
16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED? <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED	
18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.? <input type="checkbox"/> YES (If "YES," through <input type="checkbox"/> Plant Variety Protection Act <input type="checkbox"/> Patent Act. Give date: _____). <input checked="" type="checkbox"/> NO			
19. HAS THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETING IN THE U.S. OR OTHER COUNTRIES? <input checked="" type="checkbox"/> YES (If "YES," GIVE NAMES OF COUNTRIES AND DATES) March 10, 1994 USA <input type="checkbox"/> NO			
20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.			

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in section 41, and is entitled to protection under the provisions of section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT (Owner(s)) Dale R. Clark for Western Plant Breeders, Inc	CAPACITY OR TITLE Barley and Wheat Breeder	DATE Feb. 25, 1995
SIGNATURE OF APPLICANT (Owner(s))	CAPACITY OR TITLE	DATE

V A N N A

14a. Origin and Breeding History

Vanna is a soft white spring wheat selected by Western Plant Breeders from a male sterile facilitated, recurrent selection population (MSFRSP). This MSFRSP was developed by crossing Fielder, Fieldwin, and Twin onto male sterile plants in Western Plant Breeders' basic MSFRSP's in 1981 near Conrad, Montana. The F1 seed was planted near Phoenix, Arizona in the fall of 1981. The F2 seed was harvested in early May of 1982 and space planted near Conrad in late May of 1982. Seed of selected spikes were bulked and space planted as an F3 bulk near Bozeman, MT in the spring of 1983. Several F3 plants were selected in the fall of 1983 and F4 seed from plants producing white seed was planted in short plots near Bozeman in the spring of 1984. One such F4 plot was harvested and given the experimental number BZ 684-23. The resultant F5 seed (and successive generations) was used for yield testing in Montana, Idaho, and Washington from 1985 to 1991.

Heads were selected from the F9 plots grown in 1989 and planted near Phoenix, AZ in the fall of 1989. Uniform F10 rows were harvested individually in May of 1990 and seed from each selected row was used to plant a plot near Bozeman in May of 1990. Uniform F11 plots were individually harvested in the fall of 1990 and seed of each plot was used to plant a separate strip near Bozeman in the spring of 1991. Uniform F12 strips were individually harvested in the fall of 1991. Equal portions of seed from each of the harvested strips was bulked and designated Breeders seed. This Breeders seed was used to plant a four acre field near Bozeman in the spring of 1992 for the purpose of producing seed of the Foundation class. This Foundation seed was planted in 1993 to produce seed of the Registered and Certified classes. The production from this field was harvested in September and designated "Vanna". "Vanna" was first sold to the general public as Certified seed on March 10, 1994.

VARIANTS:

'VANNA' contains the dwarfing gene, *rht1*, and is therefore subject to Throwing Tall plants (Approximately one to two heads taller than the Norm) at a frequency of up to 1 per 500 plants.

'VANNA' also contains a red seed variant at a frequency of up to 18 per 10,000 SEED.

MAH 20 JUNE, 1995 per letter

V A N N A

Vanna is a stable and uniform variety in agronomic appearance and performance across several generations and growing conditions. Agronomic data to support this stability are presented in Tables 1 through 7.

14b. Novelty Statement

Vanna is most similar to the soft white spring wheat variety Penawawa. However, Vanna has purple colored auricles where as Penawawa has white auricles. Vanna is also 2.5 cm. taller than Penawawa ($t = 4.20$ w/20 df, $p < .001$), and Vanna averages 1 day later heading than Penawawa ($t = 4.35$ w/10 df, $p < .01$).

The above comparison along with the complete objective description (14 c.) show Vanna to be a novel variety of soft white spring wheat.

14c. Objective Description (see pages 4 and 5)

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK AND SEED DIVISION
BELTSVILLE, MARYLAND 20705

EXHIBIT C
(Wheat)

OBJECTIVE DESCRIPTION OF VARIETY
WHEAT (TRITICUM SPP.)

INSTRUCTIONS: See Reverse.

NAME OF APPLICANT(S) Western Plant Breeders, Inc.	FOR OFFICIAL USE ONLY
ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code) 8111 Timberline Dr. Bozeman, Montana 59715	PVPO NUMBER 9500094
	VARIETY NAME OR TEMPORARY DESIGNATION Vanna

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g., 0 8 9) or (0 9) when number is either 99 or less or 9 or less.

1. KIND:

1 1 = COMMON 2 = DURUM 3 = EMMER 4 = SPELT 5 = POLISH 6 = POULARD 7 = CLUB

2. TYPE:

1 1 = SPRING 2 = WINTER 3 = OTHER (Specify) 1 1 = SOFT 3 = OTHER (Specify)
2 = HARD

1 1 = WHITE 2 = RED 3 = OTHER (Specify)

3. SEASON - NUMBER OF DAYS FROM EMERGENCE TO:

0 5 7 FIRST FLOWERING 0 6 1 LAST FLOWERING

4. MATURITY (50% Flowering):

0 1 NO. OF DAYS EARLIER THAN 7 1 = ARTHUR 2 = SCOUT 3 = CHRIS

0 1 NO. OF DAYS LATER THAN 8 4 = LEMHI 5 = NUGAINE 6 = LEEDS
7 = Penawawa 8 = Treasure

5. PLANT HEIGHT (From soil level to top of head):

0 8 0 CM. HIGH 7 = Penawawa 8 = Fieldwin

0 3 CM. TALLER THAN 7

0 3 CM. SHORTER THAN 8 1 = ARTHUR 2 = SCOUT 3 = CHRIS
4 = LEMHI 5 = NUGAINE 6 = LEEDS

6. PLANT COLOR AT BOOTING (See reverse):

2 1 = YELLOW GREEN 2 = GREEN 3 = BLUE GREEN

7. ANTER COLOR:

1 1 = YELLOW 2 = PURPLE

8. STEM:

1 Anthocyanin: 1 = ABSENT 2 = PRESENT

1 Waxy bloom: 1 = ABSENT 2 = PRESENT

2 Hairiness of last internode of rachis: 1 = ABSENT 2 = PRESENT

1 Internodes: 1 = HOLLOW 2 = SOLID

0 4 NO. OF NODES (Originating from node above ground)

2 8 CM. INTERNODE LENGTH BETWEEN FLAG LEAF AND LEAF BELOW

9. AURICLES:

2 Anthocyanin: 1 = ABSENT 2 = PRESENT

2 Hairiness: 1 = ABSENT 2 = PRESENT

10. LEAF:

2 Flag leaf at booting stage: 1 = ERECT 2 = RECURVED
3 = OTHER (Specify):

2 Flag leaf: 1 = NOT TWISTED 2 = TWISTED

2 Hairs of first leaf sheath: 1 = ABSENT 2 = PRESENT

2 Waxy bloom of flag leaf sheath: 1 = ABSENT 2 = PRESENT

1 6 MM. LEAF WIDTH (First leaf below flag leaf)

2 7 CM. LEAF LENGTH (First leaf below flag leaf):

V A N N A

14d. Additional Description

Vanna is a semidwarf, white chaffed, soft white spring wheat. The leaves and stems of Vanna do not have a waxy bloom, but the leaf sheaths do have a waxy bloom and the auricles are purple and slightly hairy. The spikes are lax, awned, and strap shaped. The awns and glumes are white at maturity. The glumes are long, medium in width with a square shoulder, and the beak is acuminate. Seed of Vanna is mid-long, mid-wide, and ovate with rounded cheeks. The brush is long and not collared. The crease is narrow and shallow and the germ is medium in size. Vanna is approximately 1 inch taller than Penawawa and has slightly better straw strength. Vanna also has lower grain protein and better grain quality than Penawawa. Vanna is resistant to the prevalent races of stripe rust and leaf rust in the Pacific Northwest and shows susceptibility to the Hessian fly in Northern Idaho.

Variants:

Vanna contains the dwarfing gene, *rht1*, and is therefore subject to throwing tall plants (approximately one to two heads taller than the norm) at a frequency of up to 1 per 500 plants.

Vanna also contains a red seed variant at a frequency of up to 18 per 10,000 seed.

14e. Statement of Ownership

Replaced per letter MAH 20 JUNE, 1995

Western Plant Breeders, Inc. is the employer of the breeder and is rightfully entitled to ownership and all rights of the variety "Vanna".

V A N N A

14e. Statement of Ownership

'Vanna', the variety for which Plant Variety Protection is hereby sought, was developed by Dr. Dale R. Clark, an employee of Western Plant Breeders, Inc.. All rights to any invention, discovery, or development made by the employee while employed by Western Plant Breeders, Inc. were assigned by Western Plant Breeders, Inc. with no rights of any kind pertaining to 'Vanna' are retained by the employees.

VANNA

Table 1. Agronomic comparison of Vanna and Penawawa
from 1990 to 1994 in Western Plant Breeders trials.

5 years, 15 locations
(1990 - 1994)

	<u>Yield</u> <u>lbs/ac</u>	<u>T.W.</u> <u>lbs/bu</u>	<u>Plt. Ht.</u> <u>inches</u>	<u>Protein</u> <u>%</u>
<u>Vanna</u>				
90(4)	7085	58	36	11.3
91(2)	7133	58	40	11.7
92(3)	5291	57	32	11.7
93(3)	7649	60	38	10.1
94(3)	<u>8040</u>	<u>61</u>	<u>34</u>	<u>10.4</u>
mean	7036	59	36	11.0
<u>Penawawa</u>				
90(4)	6555	59	35	12.7
91(2)	6769	60	39	12.4
92(3)	5591	58	31	11.7
93(3)	7320	62	37	10.4
94(3)	<u>7765</u>	<u>61</u>	<u>33</u>	<u>11.5</u>
mean	6786	60	35	11.8

VANNA

Table 2. Yields of Vanna and Penawawa from 1992 to 1994 in Montana State University trials.

(25 location summary)

Entry	Heading Date From 1/1	Plt.Ht. inches	T.W. lbs/bu	Avg Yield bu/ac
Vanna	173	32	58	80
Penawawa	171	31	58	80

VANNA

Table 3. Yields of Vanna and Penawawa in 1992 Idaho Extension trials.

Location	Yield (bu/ac)	
	Vanna	Penawawa
Rupert	135	141
Ririe	57	61
Kimberly	106	100
Aberdeen	72	58
	---	---
mean	92.5	90

VANNA

Table 4. Yields of Vanna and Penawawa from 1992 to 1994
in Washington State University yield trials.

(31 location summary)

	<u>Yield in bushels/acre</u>			<u>Test Weight in lbs/bu</u>		
	<u>'92</u>	<u>'93</u>	<u>'94</u>	<u>'92</u>	<u>'93</u>	<u>'94</u>
Vanna	49.4	63.5	49.5	54.1	60.2	52.4
Penawawa	47.2	59.9	44.0	55.7	60.2	53.6

V A N N A

Table 5. Plant height (inches) of Vanna compared to Penawawa in Montana State Univ. trials from 1992-1994.

<u>Location</u>	<u>Yr</u>	<u>Vanna</u>	<u>Penawawa</u>
Bozeman	'92	34	34
	'93	36	35
	'94	29	26
Havre	'92	19	20
	'93	27	27
	'94	28	25
Sidney	'92	29	30
	'93	32	31
	'94	32	32
Moccasin	'92	29	27
	'93	35	34
	'94	23	23
Huntley(dry)	'92	36	32
	'93	35	34
	'94	30	29
Huntley(irr)	'92	40	41
	'93	35	33
	'94	33	34
Conrad	'92	37	36
	'93	30	28
	'94	34	32
mean		31.57	30.62

$t = 4.20$ w/20 df, $p < .001$

V A N N A

Table 6. Heading dates (from Jan. 1) of Vanna compared to Penawawa in various public and Western Plant Breeders' trials.

<u>Location</u>	<u>Year</u>	<u>Vanna</u>	<u>Penawawa</u>
Mont. St.	'92	169	169
	'93	178	176
	'94	170	168
WPB	'91	196	196
	'92	180	179
	'93	203	201
	'94	179	178
Univ. Idaho	'91	177	177
	'92	174	172
	'93	187	186
	'94	<u>169</u>	<u>168</u>
	mean	180.2	179.1

$t = 4.35$ w/10 df, $p < .01$

Table 7. Quality of Vanna compared to check varieties in Univ. of Idaho trials.

Cultivar	1991 to 1993			1991 to 1993			1991 to 1993			Corrected	
	Flour protein %	Milling yield %	Break flour yield %	Flour ash %	NIR hardness 0-100	Cookie diameter cm	Cookie diameter cm				
Alpowa	9.0 ± 0.2	63.6 ± 0.7	41.8 ± 0.9	0.43 ± 0.01	17.9 ± 1.6	8.78 ± 0.06	8.76 ± 0.05				
Calorwa	9.6 ± 0.2	63.0 ± 0.9	45.0 ± 1.0	0.44 ± 0.01		8.87 ± 0.07	8.90 ± 0.07				
Centennial	9.5 ± 0.1	65.1 ± 0.3	43.2 ± 0.6	0.41 ± 0.01	19.7 ± 1.2	8.82 ± 0.03	8.84 ± 0.03				
Dirkwin	9.6 ± 0.2	65.7 ± 0.7		0.44 ± 0.03		8.90 ± 0.06	8.93 ± 0.06				
Federation	10.3 ± 0.1	61.4 ± 0.5	38.8 ± 1.0	0.42 ± 0.01	24.1 ± 1.6	8.58 ± 0.04	8.67 ± 0.04				
Fieldwin	9.2 ± 0.1	64.1 ± 0.4	41.9 ± 1.0	0.39 ± 0.01	24.5 ± 1.6	8.85 ± 0.03	8.86 ± 0.03				
Whitebird	9.1 ± 0.1	66.9 ± 0.4	43.9 ± 0.7	0.38 ± 0.01	24.9 ± 1.2	9.05 ± 0.03	9.05 ± 0.03				
Owens	9.3 ± 0.1	62.3 ± 0.4	44.0 ± 1.1	0.40 ± 0.01	20.5 ± 1.6	8.94 ± 0.03	8.94 ± 0.03				
Penawawa	9.6 ± 0.1	62.1 ± 0.3	42.1 ± 0.6	0.44 ± 0.01	16.6 ± 1.2	8.78 ± 0.02	8.81 ± 0.02				
Treasure	8.8 ± 0.1	66.1 ± 0.3	44.6 ± 0.5	0.41 ± 0.01	19.3 ± 1.3	9.03 ± 0.02	9.00 ± 0.02				
Vanna	9.0 ± 0.3	66.1 ± 1.4		0.41 ± 0.03		8.93 ± 0.11	8.91 ± 0.11				
Wadual	10.0 ± 0.4	65.8 ± 1.8		±		8.72 ± 0.14	8.79 ± 0.14				
Wakanz	9.1 ± 0.1	64.2 ± 0.5	42.8 ± 0.9	0.42 ± 0.01	22.2 ± 1.3	9.03 ± 0.04	9.02 ± 0.04				
Average	9.2	64.9	42.5	0.4	21.5	8.9	8.9	0.1	0.0		